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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/025,473	12/26/2001	Yoshiyuki Miyamoto	NE246-US	2990
466	7590	07/01/2004	EXAMINER	
YOUNG & THOMPSON 745 SOUTH 23RD STREET 2ND FLOOR ARLINGTON, VA 22202			KOPEC, MARK T	
			ART UNIT	PAPER NUMBER
			1751	
DATE MAILED: 07/01/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/025,473	MIYAMOTO, YOSHIYUKI	
	<b>Examiner</b>	<b>Art Unit</b>	
	Mark Kopec	1751	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. ____.  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____.   | 6) <input type="checkbox"/> Other: ____.                                    |

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This action is responsive to applicant's remarks filed 4/8/04. Claims 1-8 are currently pending.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The rejection under 35 U.S.C. 101 (utility) is withdrawn in view of applicant's remarks.

Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification does not enable one of ordinary skill in the art to make or use a superconductor comprising C20 fullerene molecules polymerized into a one-dimensional chain (or methods of making such materials), in that it would require undue experimentation to do so.

The quantum of proof required to establish enablement is inextricably linked with the degree of unpredictability of the relevant art. See MPEP 2164.03.

The art of high temperature (above 30K) superconductors is an extremely unpredictable one. Small changes in composition can result in dramatic changes in or loss of superconducting properties. The amount and type of examples necessary to

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support broad claims increases as the predictability of the art decreases. See In re Fisher, 166 USPQ 18, 24 and In re Angstadt and Griffen, 190 USPQ 214, 218. Claims broad enough to cover a large number of compositions that do not exhibit the desired properties fail to satisfy the requirements of 35 USC 112. See In re Cook, 169 USPQ 298, 302 and Cosden Oil v. American Hoechst, 214 USPQ 244, 262. Merely reciting a desired result does not overcome this failure. In re Corkill, 226 USPQ 1005, 1009.

In the instant specification, applicant has not specifically disclosed any **conclusive evidence** that the claimed materials have been produced (or methods of making such materials). Applicant alludes to critical temperatures above 180K (page 6, Fig 3), but no "hard data" has been provided (actual temperature vs. resistivity plots, photomicrographs, etc) to support applicant's contention of such incredible superconductive properties. In fact, no inventive examples appear in the specification. It is unclear if applicant has produced C20 fullerene molecules polymerized into a one-dimensional chain, or if such is only a theoretical discussion. At page 6 of the specification, applicant states:

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Therefore, the transition temperature of  $C_{20}$  Fullerene molecule is  $e^{1/2}$  times (about 4.5 times) higher than the superconducting transition temperature of  $C_{60}$  Fullerene molecule (40 K) and can be expected to be as large as 180 K which is comparable to a transition temperature of a high-temperature superconducting material.

In view of the above-described consideration, Figure 3 shows the simulated results of a change in electric resistance by temperature. The resistance values are not absolute values and are normalized such that the resistance at room temperature is 1. According to the first-principle calculation, when  $C_{20}$  Fullerene molecules are polymerized in a three-dimensional manner, they undergo phase transition and relax from a closed cage structure to an open structure. Since such phase transition weakens the electron-lattice interaction, three-dimensional polymerization has to be avoided.

It appears from this description (of simulated results) that applicant has not actually produced/tested the claimed materials.

It should be noted that at the time the invention was made, the theoretical mechanism of superconductivity in these materials was not well understood. (This is still the case today). Accordingly, there appears to be little factual or theoretical basis for extending the scope of the claims much beyond the proportions and materials actually demonstrated to exhibit high temperature superconductivity. A "patent is not a hunting license. It is not a reward for the search, but a

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reward for its successful conclusion", Brenner v. Manson, 383 US 519, 148 USPQ 689.

As discussed by Professor Chu in a lecture at the Patent and Trademark Office in October 7, 1987, there are generally four measures of superconductivity: (1) zero resistivity, (2) exhibition of the Meissner effect, (3) stability to survive thermal cycling and (4) reproducibility. In the absence of zero resistivity and evidence from the Meissner effect, the sharp resistance drops may be taken only as an indication of the possible existence of superconductivity at unusually high temperatures. Resistivity drops alone are dangerous measure of superconductivity because the drops could be related to problems with testing techniques. Therefore, the current state of the superconducting art suggests that at least zero resistivity at a reproducible temperature which also shows the Meissner effect is the minimum showing necessary to claim that applicant has produced a material which exhibits superconductivity at very high temperatures.

It is believed that the above rejection addresses each of applicant's comments regarding the 112, first paragraph, enablement rejection.

In order to overcome the above rejection, applicant should provide conclusive evidence that the claimed materials (produced

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according to the specification disclosure) posses  
superconductive properties. See 37 CFR 1.93 and MPEP 608.03.

Applicant is reminded that any evidence to be presented in  
accordance with 37 C.F.R. 1.131 or 1.132 should be submitted  
before final rejection in order to be considered timely.

Any inquiry concerning this communication or earlier  
communications from the examiner should be directed to Mark  
Kopec whose telephone number is (571) 272-1319. The examiner  
can normally be reached on Monday - Friday from 9:30 AM to 6:00  
PM.

If attempts to reach the examiner by telephone are  
unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can  
be reached on (571) 272-1316. The fax phone number for the  
organization where this application or proceeding is assigned is  
703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Mark Kopec  
Primary Examiner  
Art Unit 1751

MK  
June 29, 2004